



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/667,424

09/21/2000

Yoshiyuki Sogawa

32405W043

8861

7590

06/04/2004

Beveridge DeGrandi Weilacher & Young LLP
Suite 800
1850 M Street NW
Washington, DC 20036

EXAMINER

SELBY, GEVELL V

ART UNIT

PAPER NUMBER

2615

7

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/667,424

Applicant(s)

SOGAWA, YOSHIYUKI

Examiner

Gevell Selby

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. **Claim 5, which is dependent on claim 1, is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 31, which is dependent on claim 22, of copending Application No. 09665950. Although the conflicting claims are not identical, they are not patentably distinct from each other because:**

Claim 5 with claim 1 incorporated therein claims a structure for mounting a stereo camera comprising:

a main camera taking photograph of an object in a shooting direction; and

a sub-camera taking photograph of said object from a point of view

different from a point of view of said main camera,

said main camera and sub-camera being disposed with a predetermined spacing in a direction substantially perpendicular to the shooting direction,

wherein optical axes of said main camera and said sub-camera are inclined toward the main camera side with respect to the shooting direction between said main camera and said sub-camera, and

a camera stay for mounting said cameras thereon, wherein a longitudinal direction of said camera stay is substantially perpendicular to the shooting direction.

Claim 31 with claim 22 incorporated therein claims a structure for mounting an onboard sensor, comprising:

a sensor for monitoring traffic conditions ahead of a vehicle;

a sensor assembly for assembling said sensor; and

a mounting member formed independently of said sensor assembly,

wherein said sensor assembly is attached to a vehicle body via said mounting member, and a monitoring direction of said sensor is determined based on the shape of said mounting member,

wherein said sensor assembly is a stereo camera assembly.

It is obvious that both claims are for a stereo camera attached to a mount to take pictures of objects directly in front of the cameras.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Objections

Art Unit: 2615

3. Claims ^{2,}14 and 16 objected to because of the following informalities:

Claim 14 should begin with the word "he" instead of "The".

Claim 2, line 13 and claim 16, line 3 uses the term "left-light" instead of "left-right".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 3, 5, 9, 15 - 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al., US 4879,596.**

In regard to claims 1 and 15, Miura et al., US 4,879,596, discloses a stereo camera apparatus (see figure 5) comprising:

a main camera taking photograph of an object (see figure 4, element 20a and column 3, lines 8-9); and

a sub-camera taking photograph of said object from a point of view different from a point of view of said main camera (see figure 4, element 20b and column 3 lines 8-9),

said main camera and sub-camera being disposed with a predetermined spacing, a shooting direction of said stereo camera is substantially perpendicular

to said predetermined spacing in a baseline between the main camera and the sub camera (see figure 2, elements 20a and 20b and column 1, line 63- column 2, line 5),

wherein optical axes of said main camera and said sub-camera are adjustable (see figure 4B, directions E or F, column 3, lines 62-65, and column 4, lines 7-9).

Miura et al., does not state that the two cameras are inclined toward the main camera side with respect to the shooting direction between said main camera and said sub-camera but the reference does teach that when one camera captures the target object the second camera is rotated so that the camera have the correct convergence angle (see column 5, lines 12-44). Therefore, it would have been obvious to one skilled in the art to adjust both cameras of the Miura reference to have an incline towards the main camera side when capturing an object outside of the sub camera's viewing area on the main camera side in order to achieve the correct convergence angle.

In regard to claims 3 and 17, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claims 1 and 15 respectively, wherein the optical axis of said sub-camera is adjustable (see figure 4B, directions E or F and column 5, lines 38-44).

Miura et al., does not state that the two cameras are inclined toward the main camera side with respect to the shooting direction between said main camera and said sub-camera but the reference does teach that when one camera captures the target object the second camera is rotated so that its optical axis coincides with first camera (see

column 5, lines 12-44). Therefore, it would have been obvious to one skilled in the art to adjust both cameras to have an incline towards the main camera side when capturing an object outside of the sub camera's viewing area on the main camera side in order to achieve the correct convergence angle.

In regard to claims 5 and 18, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claims 1 and 15 respectively, further comprising:

a camera stay (see figure 2, element 24) for mounting said cameras thereon, wherein a longitudinal direction of said camera stay is substantially perpendicular to the shooting direction (see column 3, lines 9-12).

In regard to claim 9, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 1, but does not disclose that a first acute angle defined between said optical axis of said main camera and the baseline is larger than a second acute angle defined between said optical axis of said sub-camera and the baseline.

It would have been obvious to one skilled in the art that since both cameras can be adjusted freely in the horizontal direction, the sub-camera would be pivoted more than the main camera in order for the camera, to have the same field of view.

In regard to claim 16, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 1,

wherein angles of inclination of said main camera and said sub-camera are set to be such angles that an area being substantially left-right symmetric with respect to a central axis of a vehicle parallel to the shooting direction, the area

being obtained on the basis of images photographed by said cameras (see figure 6, elements 20a and 20b and column 1, line 57 to column 2, line 7).

It is inherent that if an axis z was aligned with the central axis of a vehicle, the two cameras would be left-right symmetric.

6. Claims 2, 4, 10 - 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al, US 4,879,596, in view of Tanigawa et al., US 5,915,033.

In regard to claim 2, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 1,

wherein angles of inclination of said main camera and said sub-camera are set to be such angles that an area being substantially left-right symmetric with respect to a central axis of a vehicle parallel to the shooting direction (see figure 6, elements 20a and 20b).

It is inherent that if an axis z was aligned with the central axis of a vehicle, the two cameras would be left-right symmetric.

The Miura reference does not disclose:

image processing means of calculating a three dimensional distance distribution of said object based on a positional difference between a region in a reference image photographed by said main camera and a corresponding area in a comparative image photographed by said sub-camera to an image signal of said region,

wherein said corresponding area is searched in a search area having predetermined length which extends from a position substantially corresponding to said region, said positional difference is obtained from an area which is capable of setting said search area inside of said comparative image.

Tanigawa et al., US 5,915,033, discloses a stereo camera system that divides a wide visual field into a plurality of windows or regions, disposed in a two dimensional matrix, to detect the parallax between the distances for a pair of images captured by the image sensors for each window, to select the most reliable range of distance to the target and to determine in which window the target is located and then correct the distance data (see column 2, line 38 to column 3, line 8).

It would have been obvious to a person skilled in the art at the time of invention to modify Miura et al, US 4,879,596, in view of Tanigawa et al., US 5,915,033, to have an image processing means to use method of triangulation to calculate the distance from a searching a plurality of predetermined regions and correct the distance values as taught by Tanigawa.

In regard to claim 4, Miura et al, US 4,879,596, in view of Tanigawa et al., US 5,915,033, discloses the stereo camera apparatus as recited in claim 2. Miura et al., US 4,879,596, discloses that the optical axis of said sub-camera is adjustable (see figure 4B, direction F and column 5, lines 38-44).

Miura et al., US 4,879,596, does not state that the two cameras are inclined toward the main camera side with respect to the shooting direction between said main

camera and said sub-camera, but the reference does teach that when one camera captures the target object the second camera is rotated so that its optical axis coincides with first camera (see column 5, lines 12-44). Therefore, it would have been obvious to one skilled in the art to adjust both cameras to have an incline towards the camera side when capturing an object outside of the sub camera's viewing area on the main camera side.

In regard to claim 11, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 2, but does not disclose that a first acute angle defined between said optical axis of said main camera and the baseline is larger than a second acute angle defined between said optical axis of said sub-camera and the baseline.

It would have been obvious to one skilled in the art that since both cameras can be adjusted freely in the horizontal direction, the sub-camera would be pivoted more than the main camera in order for the camera, to have the same field of view.

In regard to claims 10, 12, 13, and 14, Miura et al., discloses a stereo camera as recited in claims 9, 11, 3 and 4 respectively, but does not disclose the detection of infinite distance corresponding points.

Tanigawa et al., US 5,915,033, discloses a stereo camera system that divides a wide visual field into a plurality of windows or regions, disposed in a two dimensional matrix, calculating the infinite distance correspondence points to detect the parallax between the distances for a pair of images captured by the image sensors for each window, to select the most reliable range of distance to the target and determine in which window the target is located and then correct the distance data (see column 2, line 38 to column 3, line 8).

It would have been obvious to a person skilled in the art at the time of invention to modify Miura et al, US 4,879,596, in view of Tanigawa et al., US 5,915,033, to have the method and apparatus for dividing the wide visual field into a plurality of windows, and calculating the infinite distance correspondence point to detect the parallax between the distances of the two image captured for each window, including the one positioned at an end of the sub-camera side, to determine the distance to the target object as taught by Tanigawa.

7. Claims 6 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al., US 4,879,596, in view of Lipton et al., US 5,063,441.

In regard to claims 6 and 19, Miura et al., US 4,879,596, discloses the stereo camera apparatus of claims 1 and 15 respectively, but lacks CCD cameras. Lipton et al., US 5,063,441, discloses a stereo video camera apparatus wherein both cameras are CCD cameras (see column 5, lines 27-31). The Lipton reference uses CCD cameras because most, if not all, future video cameras would incorporate some form of solid-state sensors.

It would have been obvious to a person skilled in the art, at the time of invention, to modify Miura et al., US 4,879,596, in view of Lipton et al., US 5,063,441, to have CCD cameras in order to update the camera system with a most modern technology.

8. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al., US 4,879,596 in view of Saneyoshi et al., US 5,410,346.

In regard to claims 7 and 20, Miura et al., US 4,879,596 discloses the stereo camera apparatus of claims 1 and 15 respectively, but lacks “wherein said cameras are mounted in the vicinity of a rear-view mirror of a vehicle, said cameras taking

photographs of views outside the vehicle.” Saneyoshi et al., US 5,410,346, also discloses a discloses a stereo camera apparatus (see figure 2, element 10) comprising:

a main camera taking photograph of an object in a shooting direction (see figure 2, element 11a and column 7, lines 40-51); and

a sub-camera taking photograph of said object from a point of view different from a point of view of said main camera (see figure 2, element 11b and column 7, lines 40-51),

said main camera and sub-camera being disposed with a predetermined spacing in a direction substantially perpendicular to the shooting direction (see figure 2, elements 11a and 11b and column 7, lines 40-51),

wherein said cameras are mounted in the vicinity of a rear-view mirror of a vehicle, said cameras taking photographs of views outside the vehicle (see figure 1 and figure 2).

It would have been obvious for a person skilled in the art, at the time of invention, to modify Miura et al., US 4,879,596, in view of Saneyoshi et al., US 5,410,346, to have cameras are mounted in the vicinity of a rear-view mirror of a vehicle, taking photographs of views outside the vehicle in order to monitor the conditions in front of the car.

Response to Arguments

9. Applicant's arguments filed 3/18/04 have been fully considered but they are not persuasive.

The applicants contend 1) Miura does not disclose wherein optical axes of said main camera and said sub camera are inclined toward the main camera side with respect to the shooting direction between the camera and sub-camera. 2) Miura discloses a structure wherein an optical axis of one camera can be adjusted in left and right directions, wherein another camera can be adjusted rotatably upwards downwards and right direction and these features in tandem fail to disclose the claim 1 limitations. The examiner respectfully disagrees.

Re 1) The Miura reference discloses that both camera are adjusted rotatably about their optical axis either to the left or right (column 3, lines 62-65, and column 4, lines 7-9), and when one camera captures the target object the second camera is rotated so that the cameras have the correct convergence angle (see column 5, lines 12-44). Therefore, when the first camera is inclined toward its side to pick up a target object, the second camera is also adjusted to be inclined towards the first cameras side so that the cameras are aligned correctly.

Re 2) The Miura reference discloses that the two cameras can both be adjusted both horizontally (see column 3, lines 62-65, and column 4, lines 7-9) and vertically (see (column 3, lines 32-35, and column 3, lines 45-47). Thus, the stereo cameras of the Miura reference are adjusted to incline to the first camera side or the second camera side as claimed depending the target object.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gevell Selby whose telephone number is 703-305-8623. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary, Ngoc-Yen Vu can be reached on 703-305-4946. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gvs



NGOC-YEN VU
PRIMARY EXAMINER